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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,310	02/12/2002	Steve A. Beaudin	584-1050	6438

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EXAMINER
SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 04/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
10/074,310	Beaudin et al.
Examiner	**Group Art Unit**
Barbara Summons	2817

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-19 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1,2,4-6, and 8-18 is/are rejected.

☒ Claim(s) 3,7, and 19 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The drawing(s) filed on 2/12/02 is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other _____

Office Action Summary

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR § 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference signs "20", "22", "24", "26", "28", "30", "32", "34", and "36" need to be labeled in Fig. 3 (see the discussion on page 8 of the spec.); and "40" (see pg. 9, ln. 1 of the spec.) has not been labeled in Fig. 4. However, the "handset" of Fig. 4 should be given a different reference sign because reference sign "40" has been appropriately used in Fig. 8 (see pg. 9, lns. 29-30 of the spec.) and should not also be used to label a different part in Fig. 4 [see 37 CFR § 1.84(p)(4)]. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: On page 6, note that a brief description of Fig. 8 needs to be provided before line 35. On page 9, on line 30, it appears that "filters" should correctly be --resonators-- (see e.g. pg. 10, ln. 2). Similarly: on page 9, on line 31, "filters" should be --resonators--; on page 9, line 32, "filters" should be --resonators--; and on page 9, line 33, "filters" should be --resonators--. Appropriate correction is required.

Claim Objections

3. Claims 1, 2, 8, 12, and 16 are objected to because of the following informalities:

In claim 1, on line 4 thereof, note that "to anti-resonant" should be either --to be anti-resonant-- or --to anti-resonate--.

Similarly, the same chosen change should be made at: Claim 2, line 4; Claim 8, line 5; Claim 12, lines 4-5; and Claim 16, line 4. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 1, 12-14, and 16-18 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ikada U.S. 5,864,262.

Fig. 15 of Ikada discloses a radio frequency band reject filter for rejecting frequencies on the low frequency side outside the passband of the filter 61 (see e.g. the abstract, lines 7-10), the band reject filter comprising a shunt acoustic resonator 64 that resonates generally at the reject frequency band (see e.g. the paragraph bridging cols. 4 and 5 and see claim 16 where resonator 64 is the third one-port resonator and see col. 13, lines 33-35 and col. 14, lns. 48-54) and a series resonator 63 that is anti-resonant generally at the reject frequency band (see col. 4, lns. 46-53 and see claim 15, the last paragraph thereof and col. 13, lns. 36-42 with col. 12, lns. 59-62).

Regarding claims 12-14, the double mode filter (61) with the band reject filter (63 and 64) of Ikada is disclosed as part of a duplexer for a mobile telephone (see col. 1, lns. 12-15; col. 2, lns. 7-10 and 16-18; and col. 3, lns. 1-3), and the resonators 63 and 64 of the band reject filter are one-port surface acoustic wave (SAW) resonators.

Regarding claims 16-18 the receive side of a mobile telephone duplexer system inherently requires a low noise amplifier (LNA) in order for the device to function adequately (see also other prior art of record as evidence of the inherency, e.g. Frank Fig. 2 applied below).

6. Claims 1, 2, 4-6, and 8-15 are rejected under 35 U.S.C. § 102(e) as being anticipated by Frank U.S. 6,489,862.

Fig. 4 of Frank discloses a radio frequency band reject filter which is an inter-stage band reject filter in a power amplifier for a cellular radio telephone network (see Fig. 2, the abstract, the last four lines thereof, and col. 1, ln. 47), the band reject filter comprising (see e.g. Fig. 7) a plurality one-port shunt thin film bulk acoustic resonators (FBARs 34 and 36) having a resonant frequency F_B and a plurality of one-port series FBARs (30 and 32) having a different resonant frequency F_A. Regarding claims 5 and 10, the FBARs may also be SAW resonators (see claim 2). Although Frank does not explicitly disclose that the resonant frequency F_B of the shunt resonators and the anti-resonant frequency of the series resonators are in the reject frequency band, in order for the filter in Fig. 7 of Frank to function as a band reject filter the series resonators must inherently provide a high impedance (i.e. be anti-resonant) "generally at" the reject frequency

band, and the shunt resonators must inherently provide a low impedance to ground (i.e. be resonant) "generally at" the reject frequency band (see other prior art as evidence e.g. Chen '566).

Regarding claims 12-15, the band reject inter-stage filter of the power amplifier of Frank is as much a part of the duplexer of Frank's Fig. 2, as Applicants' TX reject filter and power amplifier inter-stage filter are a part of the "Duplexer" of Applicants' Fig. 3.

Allowable Subject Matter

7. Claims 3, 7, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or fairly suggest a band reject filter having each of the recited features, especially having a plurality of series and shunt resonators (claim 2) combined with the plurality of resonators being formed as arrays (see claim 3), or combined with a high Q matching network for reducing "the apparent capacitance of the filter outside the reject frequency band" (see claim 7). The prior art of record also does not disclose or teach a low noise amplifier input stage with a band reject filter formed of FBARs (see claim 19).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chen et al. U.S. 5,610,566 provides evidence that for individual SAW resonators to function as band reject filters the series resonators must be anti-resonant at the reject frequency band and the shunt resonators must be must be resonant at the reject frequency band (see e.g. claims 1 and 2). However, in Chen the SAW resonators in series [see Figs. 5(a) and 5(b)] provide a band reject filter at the reject band lower than the passband of the filter, and the shunt resonators provide a band reject filter at the reject band higher than the passband of the filter, so the series and shunt resonators do not combine to form a band reject filter.

Yatsuda U.S. 5,521,453 (see Figs. 14-18) is similar to Chen et al.

Seki et al. JP 11-220354 discloses a SAW band reject (i.e. notch) filter having series and shunt SAW resonators (Fig. 1) with a wide rejection band (see Figs. 4, 6, 7, and 9).

Ichikawa et al. JP 8-065097 discloses a SAW band reject filter (Fig. 1) comprising series and shunt resonators I, II, and III.

Turunen U.S. 5,473,295 discloses a duplexer with a SAW notch filter.

Hickernell U.S. 6,201,457 discloses a SAW notch filter comprising a SAW resonator and a delay line.

10. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.

Barbara Summons

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Primary Examiner
Art Unit 2817

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April 28, 2003